

FACTORS AFFECTING ESTUARINE POPULATIONS OF *NEREOCYSTIS*
LUETKEANA IN KACHEMAK BAY, ALASKA

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Nereocystis luetkeana forms extensive kelp beds in Kachemak Bay, Alaska. Salinity and turbidity gradients apparently regulate kelp bed distribution throughout this estuary. The beds are large at the entrance of the bay, only solitary stands occur in the inner bay, and no kelp is found at the head of the bay. The role of salinity and turbidity on *Nereocystis* sporophyte growth was investigated by performing reciprocal transplants among three beds along the bay axis and regularly measuring stipe growth. The effects of salinity and light on spores were studied in the laboratory by recording sinking tendency, settlement success, germination success, and germ tube length under different salinity and light levels. Grazing effects of *Lacuna vineta* impacted the survival of *Nereocystis* transplants *in-situ* and on plants of different age classes in the laboratory. Overall, this study suggests a possible negative estuarine effect on sporophytes transplanted from the outer to the inner bay and on certain aspects of spore development. Herbivory pressure had significant localized effects on *Nereocystis* survival and was most pronounced on juvenile plants. The dynamics of *Nereocystis* kelp beds in Kachemak Bay results from large-scale environmental factors and local-scale biological processes.

